

REMARKS/ARGUMENTS

The final Office Action of November 25, 2008 has been carefully reviewed and this paper is responsive thereto. Claims 23, 25, 27-31, 33-35, 37-43 and 45-49 were pending in the application. Claims 23, 25, 27, 28 and 49 stand rejected and claims 29, 31, 33-35, 37, 41 and 47-49 stand objected to. By this response, claims 23, 25 and 49 have been amended. Applicants appreciate the statement in the Office Action that claims 30, 38-40, 42, 43, 45 and 46 are allowed. No new matter has been introduced into the application. As explained in more detail below, Applicants submit that all claims are in condition for allowance and respectfully request such action.

Claim Amendments

Claims 23, 25 and 49 have been amended. Claim 23 has been amended to include the feature of “wherein the computer control adjusts the re-injection of the brain fluid by the brain fluid pumping mechanism based on the measured electrical conductivity of the brain fluid.” This amendment is supported at least by paragraph [0023] of the application as originally filed.

Claim 25, which depends from claim 23, has been amended to delete the feature of responsively controlling “fluid delivery,” in view of the amendment to independent claim 23.

Claim 49 has been amended to claim the feature of a “means for adjusting the delivery of the modulated ion-content fluid into the region of the patient’s brain, based on the monitored ion concentration of the brain fluid.” This amendment is supported at least by paragraph [0023] of the application as originally filed.

Specification Objections

The disclosure was objected to due to claims 29, 31, 33-35, 37, 41 and 47-49 including claim elements “means for measuring, adjusting, pumping, calculating, filtering, treating, modifying and monitoring,” which are means plus function limitations. The written description was alleged to only implicitly or inherently set forth the corresponding structure, material, or acts that perform the claimed function. The Applicants respectfully traverse the objection by stating on the record what corresponding structure, material or acts may perform the claimed functions.

Referring to claim 29, the “means for measuring the electrical conductivity of brain fluid after the modulated ion-content fluid is injected into the patient’s brain” may be an electrical probe, as disclosed in at least paragraph [0023] of the application as originally filed. The “means for adjusting the delivery of the modulated ion-content fluid, based upon the measured electrical conductivity of the brain fluid” may be a computer that controls the pump, as disclosed in at least paragraph [0023] of the application as originally filed.

Referring to claim 31, the “means for pumping the modulated ion-content fluid into the patient’s brain according to a predetermined flow rate” may be a pump, which may be computer controlled that reads and executes stored program instructions, as disclosed in at least paragraph [0016] of the application as originally filed.

Referring to claim 33, the “means for measuring ion concentration in the brain fluid after the modulated ion-content fluid is injected into the patient’s brain” may be an electrical probe, as disclosed in at least paragraph [0023] of the application as originally filed.

Referring to claim 34, the “means for adjusting the delivery of the modulated ion-content fluid based on the measured ion concentration” may be a computer that controls the pump, as disclosed in at least paragraph [0023] of the application as originally filed.

Referring to claim 35, the “means for calculating ion concentration in the brain fluid using a membrane potential equation” may be a computer as disclosed in at least paragraph [0023] of the application as originally filed. The “means for adjusting the delivery of the modulated ion-content fluid based upon the calculated ion concentration” may be a computer that controls the pump, as disclosed in at least paragraph [0023] of the application as originally filed.

Referring to claim 37, the “means for measuring the electrical conductivity of the brain fluid after the modulated ion-content fluid is injected into the patient’s brain” is in fact specified within the same claim as comprising “an electrical probe configured and adapted for insertion into brain fluid to measure conductivity or resistance of brain fluid.”

Referring to claim 41, the “means for measuring electrical activity of predetermined most likely epileptic brain cells” may be an electrical probe, as disclosed in at least paragraph [0023] of the application as originally filed.

Referring to claim 47, the “means for filtering fluid to adjust fluid ion concentration” may be a filtering technique, as disclosed in at least paragraph [0018] of the application as originally filed.

Referring to claim 48, the “chemical means for treating fluid to adjust ion concentration” may be a chemical treatment process, as disclosed in at least paragraph [0018] of the application as originally filed.

Referring to claim 49, the “means for modifying ion concentrations of a fluid to render modulated ion-content fluid using a predetermined process” may be filtering or chemical treatment processes, as disclosed in at least paragraph [0018] of the application as originally filed. The “means for substantially continuously pumping the modulated ion-content fluid into a localized region of the patient's brain” may be a pump, which may be computer controlled that reads and executes stored program instructions, as disclosed in at least paragraph [0016] of the application as originally filed. The “means for monitoring the ion concentration of brain fluid proximate to the region” may be an electrical probe, as disclosed in at least paragraph [0023] of the application as originally filed. The “means for adjusting the delivery of the modulated ion-content fluid into the region of the patient's brain, based on the monitored ion concentration of the brain fluid” may be a computer that controls the pump, as disclosed in at least paragraph [0023] of the application as originally filed. The “means for diagnosing an epileptic condition in a patient,” has been deleted, rendering the objection moot with respect to this feature.

Claim Rejections - 35 U.S.C. § 112

Claim 49 was rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for providing insufficient disclosure for the feature of a “means for diagnosing an epileptic condition in a patient.” This feature has been deleted from claim 49, rendering the rejection moot.

Claim Rejections - 35 U.S.C. § 103(a)

Claims 23 and 25 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 4,445,500 to Osterholm (“Osterholm”) in view of U.S. Patent No. 5,685,313 to Mayevsky (“Mayevsky”). As noted above, independent claim 23 has been amended to include an additional feature. Amended claim 23 now recites the following:

23. (Currently Amended) A system for controlling epileptic seizures comprising:

- a) a brain fluid pumping mechanism, having an input, coupled to a patient's brain for extracting brain fluid, and having an output;
- b) a fluid ion adjustment mechanism coupled to said output of said brain fluid pumping mechanism, said fluid ion adjustment mechanism having an output from which modulated ion-content fluid is produced;
- c) a catheter, having an input coupled to the output of said ion adjustment mechanism and having an output inserted into a predetermined region of a patient's brain;
- d) computer control that reads and executes stored program instructions that cause the pumping mechanism to pump the extracted fluid according to the program, and
- e) an electrical probe in the brain providing an electrical output related to measurement of an ion-concentration related brain parameter, whereby brain fluid is extracted from a patient's brain, ion-concentration of said fluid is adjusted and said brain fluid is re-injected into said brain, wherein the computer control adjusts the re-injection of the brain fluid by the brain fluid pumping mechanism based on the measured electrical conductivity of the brain fluid.

The Office Action stated on page 8 that the “prior art of record does not teach or otherwise render obvious at the time the invention was made a fluid pumping mechanism with

means for adjusting the delivery of the modulated ion-content fluid based upon the measured electrical conductivity of the brain fluid.” By this response, claim 23 was amended to include the feature of “wherein the computer control adjusts the re-injection of the brain fluid by the brain fluid pumping mechanism based on the measured electrical conductivity of the brain fluid.” The amendment to claim 23 thus incorporates the concepts indicated to be allowable over the prior art of record. Neither Osterholm nor Mayevsky, either alone or in combination teach or suggest the feature of “wherein the computer control further adjusts the re-injection of the brain fluid by the brain fluid pumping mechanism based on the measured electrical conductivity of the brain fluid.” Accordingly, amended claim 23 is patentable over Osterholm in view of Mayevsky. Claim 25 depends from claim 23 and is patentable over Osterholm in view of Mayevsky for at least the same reasons as amended claim 23 and for the additional features recited therein.

Claims 27 and 28 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 4,445,500 (“Osterholm”) in view of alleged applicant admitted prior art (AAPA). Claim 27 depends from claim 25, which depends from independent claim 23, and claim 28 depends from claim 27. Neither Osterholm nor alleged AAPA, either alone or in combination, provides a teaching that would render claim 23 or claim 25 obvious to a person of ordinary skill in the art. Thus, claims 27 and 28 are each patentable over Osterholm for at least the same reasons as claim 23 and claim 25 are patentable over the proposed combination of prior art, and for the additional features recited therein.

Claim 49 was rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 4,445,500 (“Osterholm”) in view of alleged applicant admitted prior art (AAPA) and further in view of U.S. Patent No. 6,402,941 to Lucido et al. (“Lucido”). By this response, claim 49 was amended to recite the following:

49. (Currently Amended) Apparatus for treating epilepsy and other neurological disorders of the brain comprising:

means for modifying ion concentrations of a fluid to render modulated ion-content fluid using a predetermined process;

means for substantially continuously pumping the modulated ion-content fluid into a localized region of the patient's brain;

means for monitoring the ion concentration of brain fluid proximate to the region; and

means for adjusting the delivery of the modulated ion-content fluid into the region of the patient's brain, based on the monitored ion concentration of the brain fluid,

where the ion-content fluid is pumped to the patient's brain.

As noted above, Office Action stated on page 8 that the "prior art of record does not teach or otherwise render obvious at the time the invention was made a fluid pumping mechanism with means for adjusting the delivery of the modulated ion-content fluid based upon the measured electrical conductivity of the brain fluid." By this response, claim 49 was amended to include the feature of "means for adjusting the delivery of the modulated ion-content fluid into the region of the patient's brain, based on the monitored ion concentration of the brain fluid." The amendment to claim 49 thus incorporates the concepts indicated to be allowable over the prior art of record. None of Osterholm, AAPA or Lucido, either alone or in combination teach or suggest the feature of "means for adjusting the delivery of the modulated ion-content fluid into the region of the patient's brain, based on the monitored ion concentration of the brain fluid." Accordingly, amended claim 49 is patentable over Osterholm in view of AAPA and Lucido. Applicants respectfully request reconsideration and withdrawal of the 35 U.S.C. § 103(a) rejections.

Conclusion

It is respectfully submitted that the pending claims are in condition for allowance. The Examiner is invited to contact the undersigned at the telephone number provided below should it be deemed necessary to facilitate prosecution of the application.

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Amendment dated January 26, 2009
Reply to Office Action of November 25, 2008

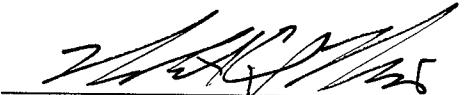
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Respectfully submitted,

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Dated: January 26, 2009

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